



United States Department of the Interior

U.S. Geological Survey
Biological Resources Discipline

COLUMBIA RIVER RESEARCH LABORATORY

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A. Title:

Application for Permit for Scientific Purposes under the Endangered Species Act of 1973.

Study Title: Wind River Watershed Restoration

B. Species:

Steelhead *Oncorhynchus mykiss* from the Wind River, WA, Lower Columbia River
Evolutionarily Significant Unit (ESU).

C. Date submitted:

June 27, 2006

D. Applicants Identity:

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E. Information on Personnel, Cooperators, and Sponsors:

Lead Agency: U.S. Geological Survey, Biological Resources Discipline
Western Fisheries Research Center
Columbia River Research Laboratory
5501-A Cook-Underwood Rd.
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Scientists: Dr. Patrick J. Connolly, Team Leader, Lead Research Fish Biologist
Ian G. Jezorek, Fishery Biologist
Kyle Martens, Fishery Biologist
Brady Allen, Fishery Biologist
Jodi Charrier, Fishery Biologist
Carrie Munz, Fishery Biologist

See appendix 1 for resumes

Cooperators: U.S. Geological Survey, Biological Resources Discipline
(Contact: Matt Mesa, 509 538 2299)
U.S. Fish and Wildlife Service's Lower Columbia River Fish Health Center,
(Contact: Susan Gutenberger, 509 493 3156)
U.S. Forest Service's Trout Lake Ranger District,
(Contact: Bengt Coffin, 509-395-3385)
U.S. Forest Service, Gifford Pinchot National Forest Headquarters,
(Contact: Diana Perez, (360) 891-5108)
Washington Department of Fisheries and Wildlife,
(Contact: Dan Rawding, 360-906-6747)
Yakama Nation, (Contact: Lee Carlson, 509-865-6262)
Underwood Conservation District, (Contact: Jim White, 509-493-1936)

Sponser: Bonneville Power Administration
Fish and Wildlife Division
905 NE 11th Ave
Portland, OR 97208-3621
John Baugher, COTR, 503-230-4512

Disposition of Mortalities:

When possible, specimens will be provided to the U.S. Fish and Wildlife Service's Lower Columbia River Fish Health Center for full disease profiling. See above for contact information.

F. Project Description, Purpose, and Significance:

This is a request for a permit for scientific purposes under the Endangered Species Act of 1973. This work in the Wind River subbasin is ongoing as part of a multiagency research effort. Funding for 2007 and beyond is likely through two sources: 1) Bonneville Power Administration for a multi-agency project (see section E for cooperators) entitled "Wind River Watershed Restoration" and 2) U.S. Fish and Wildlife Service to investigate potential interactions of introduced spring Chinook salmon on juvenile steelhead. Spring Chinook were originally not present in the Wind River above Shipherd Falls. To supplement the fishery, they were introduced into the Wind River above Shipherd Falls through rearing and release at Carson National Fish Hatchery as early as 1938, but with little success. During the mid 1950s, adult spring Chinook were captured at Bonneville Dam and transported to Carson National Fish Hatchery for spawning. Shipherd Falls was laddered in 1956 to allow adult Chinook access to Carson Fish Hatchery. Spring Chinook of Carson National Fish Hatchery origin are currently an unlisted run. Additional work in the Wind River subbasin is a collaborative effort with fellow Columbia River Research Laboratory scientists conducting a study of nutrient enhancement in select tributaries of the Wind River (ESA Permit 1479). Results of these studies will provide data and models that demonstrate how habitat conditions, such as temperature and available cover, influence fish growth and potential survival, and will attempt to demonstrate limiting factors to juvenile steelhead populations, particularly in the Wind River basin. We also plan to investigate differing life-history strategies utilized by steelhead/rainbow trout within different habitats and at varying fish densities and species assemblages. Our studies will provide monitoring data on restoration activities conducted within the Wind River subbasin by the U.S. Forest Service. This type of information is important to various entities that manage salmonids, including federal and state resource agencies, conservation groups, and Native American tribes. Although we will focus on steelhead and Chinook within the Wind River subbasin, our conclusions should be applicable to other anadromous salmonid populations, many of which are or recently have been at perilously low levels (Nehlsen et al. 1991).

All studies will be conducted in the Wind River subbasin in southwest Washington, where we have been conducting research since 1998 (Connolly and Jezorek 2006) under ESA Permit 1135. The Wind River is inhabited by threatened Lower Columbia River ESU steelhead. These are the only listed species in the Wind River above Shipherd Falls, which is where our work will occur. In 1997, Washington Department of Fish and Wildlife rated the Wind River summer run steelhead as critical. Due to the status of this stock, the Wind River summer steelhead have the highest priority for restoration in the State of Washington's Lower Columbia Steelhead Conservation Initiative (WDFW 1997). The Independent Scientific Advisory Board for the Northwest Power Planning Council and the National Marine Fisheries Service, expressed needs for increased monitoring of both tributary habitats and their limiting factors and the ecological interaction of hatchery and wild salmonids (ISAB 2001). The Management Plan of the Wind River Subbasin Plan (LCFRB 2004) lists the Wind River as a long-term monitoring site for the Gorge. The plan expresses a need for intensive monitoring for fish, defined as "life-cycle, population assessments, juvenile and adult abundance estimates, and adult run reconstruction" as

well as intensive monitoring for habitat, defined as “stream/riparian surveys, and continuous stream flow assessment”. Much of our work fits within the Action Effectiveness Monitoring segment of the Subbasin Plan. Due to the status of this stock, the Wind River summer steelhead have the highest priority for restoration in the State of Washington’s Lower Columbia Steelhead Conservation Initiative (WDFW 1997). We request this permit through 12/31/2011.

G. Project Methodology

Contingent upon funding, we expect this project to begin in March 2007 and continue through at least December 2011. In the spring, summer, and fall we will take (i.e., capture and handle) juvenile steelhead and unlisted Chinook salmon in first, second, third, and fourth order streams in the Wind River basin using a Smith-Root model 12-B POW backpack electrofisher. Sampling will involve collection of fish from select stream sections to assess habitat associations, growth and condition, and to tag fish with Passive Integrated Transponder (PIT) tags. Summer sampling will include electrofishing a 500-m or 100-m reach of first, second, or third order stream size within select index streams to estimate the density of juvenile and resident salmonids. During summer, we plan to conduct snorkel surveys to assess population density of steelhead and Chinook salmon at selected sites within the Wind River basin. Snorkel surveys will be conducted primarily in the mainstem reaches of the Wind River, Trout Creek, and Panther Creek but may also include upstream reaches of tributary streams. Other methods we may use to collect fish include minnow traps, angling, seining, or weir traps. We plan to install a series of instream PIT tag detectors to monitor movements of PIT-tagged fish. Data from PIT-tagged fish will also be available from detectors at Bonneville Dam and other locations.

To estimate density, we will conduct an intensive habitat survey during summer low-flow conditions. Within a week of a habitat survey, an electrofishing survey will be conducted on a systematic sample of habitat units within strata of habitat types (e.g., pools, glides, riffles). Habitat units chosen for sampling will be blocked off with nets to insure no movement into or out of the unit during sampling. A backpack electrofisher will be used to conduct two or more passes under the pass-removal method (Zippin 1956; Bohlin et al. 1989). The field guides of Connolly (1996) will be used to insure that a controlled level of precision for a population estimate is achieved for at least two age groups (e.g., young-of-year, age 1 or older) of each salmonid species within a sampling unit. The use of the field guides in combination with the use of a stratified systematic sampling design will reduce the number of passes conducted and reduce the number of units sampled, which lessens the chance that individual fish will be exposed to potentially harmful effects of electrofishing. We will operate electorshockers at the lowest possible effective voltage setting using a pulsed DC power setting to minimize chance of injury or mortality. All fish seen will be netted and removed from the water as quickly as possible. Prior to workup, fish will be held in fresh ambient temperature stream water, which will be monitored and changed as needed to minimize thermal or low oxygen stress. Aerators will be present and will be used in holding and recovery buckets if needed.

Upon capture, fish will be anesthetized with a 50 mg-per-liter solution of tricaine methanesulfonate (MS-222) to mitigate the effects of handling stress, loss of mucous coating on skin, and fish thrashing. Anesthetized fish will be measured to the nearest millimeter fork length on a clean polyethylene measuring board and weighed to nearest gram scale in a clean weighing dish on a digital scale. From a subsample of fish, scale samples will be collected for aging.

From a subsample of fish in select areas, non-lethal fin clips may be taken for genetics assessment. Fin clips may be taken from the caudal, anal, pectoral or pelvic fins; we will clip only a small portion of a fin for a sample. Adipose fins would not be clipped. Biological data (e.g., length, weight, disease status, and scale samples) will be collected from fish in such a manner as to minimize handling stress, and fish will be held under optimal conditions and released as rapidly as possible.

We will directly take some steelhead and Chinook for disease profiling by USFWS Lower Columbia River Fish Health Center. The fish will be checked for a variety of viral, bacterial, and parasitic agents. This effort will help track the incidence and spread of various diseases and parasites and determine risks posed by hatchery origin fish. Whenever possible, indirect mortalities will be substituted for direct mortalities.

Steelhead over 70 mm fork length will be PIT tagged. Chinook over 65 mm fork length will be PIT tagged. PIT-tagging protocol will follow that outlined by the Columbia Basin Fish and Wildlife Authority PIT Tag Steering Committee (1999). All data from PIT-tagged fish will be entered into the PTAGIS database maintained by Pacific States Marine Fisheries Commission. We plan to deploy several instream PIT tag detectors at key locations in the subbasin, in addition to the two detectors we currently maintain in Hemlock Lake fish ladder, to monitor movement of tagged fish for life-history information.

H. Description and Estimates of Take:

1. Permission is requested to “take” Wind River steelhead, for scientific purposes.
2. Sampling will occur in the Wind River, WA. Sampling will primarily occur in March through October, but may include limited sampling in all months of the year to accomplish project tasks.
3. Adult steelhead spawn-year estimates by Washington Department of Fish and Wildlife have increased from less than 500 fish per year during the period 1997 to 2000, to an average of greater than 500 fish per year during 2001 to 2005 (2001 = 416; 2002 = 669; 2003 = 1,067; 2004 = 816; 2005 = 542; Rawding and Cochran a). A trend of increasing densities of age 0 steelhead has been noted by USGS personnel by both electrofishing and snorkel surveys conducted from 2000 – 2005, with a peak in most areas during 2004 (Connolly and Jezorek 2006). Smolt numbers, monitored by WDFW at the lower Wind River smolt trap have been, 25,794 in 2001; 11,101 in 2002; 21,811 in 2003; 32,006 in 2004; and 42,846 in 2005 (Rawding and Cochran a; Rawding and Cochran b)
4. For estimated take, see Table 1. Take estimates are derived using a worst case scenario of 5% mortality from electroshocking. We anticipate no take of USFWS listed species, there are none present in the Wind River.

Table 1. Estimated take of Lower Columbia River Evolutionarily Significant Unit steelhead *Oncorhynchus mykiss* for Wind River Watershed Restoration Project.

Number of individuals	Species, ESU	Life stage	Origin	Take activity category	Requested unintentional mortality	Location	Dates
2,450	steelhead, Lower Columbia	fry, juvenile	Wild	Capture, handle, release	75	WA, Wind River	April-October
50	steelhead	fry, juvenile	Wild	Intentional mortality	50	WA, Wind River	April-October
3,500	steelhead, Lower Columbia	juvenile	Wild	Capture, handle, PIT tag, release	175	WA, Wind River	April-October
2,000	steelhead Lower Columbia	fry, juvenile	Wild	Harass (snorkel)	NA	WA, Wind River	April-October
20	steelhead Lower Columbia	adult	Wild	Harass (snorkel)	NA	WA, Wind River	April-October

5. We expect a maximum mortality of 5% of fish to be handled (Table 1). Mortality of 5% would yield 300 steelhead. We expect 50 steelhead juveniles to be direct mortality and any additional mortalities to be indirect. Direct mortalities will go to USFWS Lower Columbia River Fish Health Center for disease profiling (see section E for contact information).
6. Mortality for this study has consistently been under 5%. Sampling mortality of juvenile steelhead was 3.6% in 2003, 2.1% in 2004, and 1.8% in 2005.

I. Transportation and Holding: NA

J. Cooperative Breeding Program: Willing to contribute as appropriate for our staff and facility.

K. Previous or Concurrent Activities Involving Listed Species:

Permit 1135 – Authorizes take of Lower Columbia River steelhead

Permit 1383 _ Authorizes take of Middle Columbia River steelhead, Lower Columbia River steelhead and Chinook, and Columbia River chum

Permit 1479 – Authorizes take of Upper Columbia River steelhead and Chinook

No mortalities of listed fish occurred during sampling under Permit 1383.

See Appendix 2 for annual reporting of mortalities under Permits 1135 and 1479.

L. Certification:

I hereby certify that the foregoing information is complete, true, and correct to the best of my knowledge and belief. I understand that this information is submitted for the purpose of obtaining a permit under the Endangered Species Act of 1973 (16 USC 1531 et seq.) and regulations promulgated thereunder, and that any false statement may subject me to the criminal penalties of 18 USC 1001, or penalties provided under the Endangered Species Act of 1973.

Signature

Date

Dr. Patrick J. Connolly
Research Fishery Biologist

References:

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- Connolly, P.J. and I.G. Jezorek. 2006. Wind River Watershed Restoration. Annual Report for 2003. Project Number 1998-019-01, Prepared for: Bonneville Power Administration, Portland, OR.
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